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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,851	07/10/2003	Tomohiro Okumura	2003_0932A	9994
513	7590	09/12/2005	EXAMINER	
WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			ALEJANDRO MULERO, LUZ L	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/615,851

Applicant(s)

OKUMURA ET AL.

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-10, 12 and 13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-10, 12 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)     | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/09/05 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2, 5-9, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin, Jr. et al., U.S. Patent 6,280,563 in view of Tobe et al., U.S. Patent 5,891,349.

Baldwin, Jr. et al. shows the invention as claimed including an apparatus for plasma doping, comprising: a vacuum container 12 defining a chamber therein, the container having a portion made of a dielectric material such as quartz (see col. 7-lines 2-3) and bearing an impurity 56 to be doped in a substrate 11 provided in the chamber; and a plasma source (for example, 40) operable to generate a plasma in the chamber by forming an electric field through the portion of the container, so as to cause ion in the plasma to impinge against the portion of the container to draw the impurity out of the portion of the container into the chamber, wherein the impurity can comprise aluminum and wherein the plasma source comprises: a coil or antenna 36; a power source operable to apply a high frequency power to a first end of the coil or antenna so as to generate the plasma in the chamber, wherein the power source comprises a first power supply 40 operable to supply a first power with a first frequency and a second power supply 48 operable to supply a second power with a second frequency, and wherein a capacitor 39 or note that matching network contains variable reactances or capacitors (see col. 7-lines 35-39, and col. 11-lines 25-30 and fig. 1 and its description).

Baldwin, Jr. et al. does not expressly disclose wherein the second frequency of the second power is less than one tenth of the first frequency of the first power and wherein an impedance of the coil or antenna with respect to the first power with the first frequency is at least two times more than the impedance of the capacitor coupled to the

Art Unit: 1763

coil or the antenna, and wherein an impedance of the coil or antenna with respect to the first power with the first frequency is at least one fifth of the impedance of the capacitor coupled to the coil or the antenna. Tobe et al. discloses using a radio frequency power source 52 to be coupled to an antenna with frequencies ranging from 10 kHz to 100 MHz (see col. 9-lines 16-20). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Baldwin, Jr. et al. so as to provide radio frequency power supplies having usable frequencies in the range of Tobe et al. because such power supplies are shown to be suitable for supplying power to antennas in an inductively coupled apparatus. Furthermore, with respect to the particular claimed relative frequencies and impedances, the limitations are directed to the method instead of the apparatus. However, since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of Baldwin, Jr. et al. modified by Tobe et al. is capable of producing the claimed relative frequencies and impedances.

With respect to claims 2 and 9, note that in Baldwin, Jr. et al. the impurity 56 is deposited on a surface of the portion of the container.

Concerning claims 5 and 12, note that a second end of the coil or antenna in Baldwin, Jr. et al. is grounded through node 38.

With respect to claims 6 and 13, note in Baldwin, Jr. et al. the presence of a biasing electrode 44 provided between the coil or antenna and the portion of the container and a second power source 57 to apply a second high frequency power to the biasing electrode.

Furthermore, with respect to claim 7, note that in Baldwin, Jr. et al. a device can be formed by the apparatus of fig. 1.

Claims 1-3, 5-10, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., U.S. Patent 6,624,084 in view of Baldwin, Jr. et al., U.S. Patent 6,280,563 and Tobe et al., U.S. Patent 5,891,349.

Maeda et al. shows the invention as claimed including an apparatus for plasma doping, comprising: a vacuum container defining a chamber therein, the container having a portion made of a dielectric material such as quartz (see col. 9-lines 2-3) and bearing an impurity to be doped in a substrate provided in the chamber (see conductive member of fig. 1B which can be a material such as aluminum); and a plasma source 11 operable to generate a plasma in the chamber by forming an electric field through the portion of the container, so as to inherently cause ion in the plasma to impinge against the portion of the container to draw the impurity out of the portion of the container into the chamber, wherein the impurity can comprise aluminum (see fig. 1B and 3 and their description).

Maeda et al. is applied as above but does not expressly disclose the claimed power source and a biasing electrode provided between the coil and the antenna.

Art Unit: 1763

Baldwin, Jr. et al. discloses a power source applied to a coil wherein the power source comprises a first power supply 40 operable to supply a first power with a first frequency and a second power supply 48 operable to supply a second power with a second frequency. Furthermore, Baldwin, Jr. et al. also discloses a biasing electrode 44 provided between the coil or antenna and the portion of the container (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Maeda et al. so as to include the power source and biasing electrode of Baldwin, Jr. et al. because such a power source allows for greater control over the process conducted within the apparatus and the presence of the biasing electrode allows for effective inductive coupling of the plasma in the processing chamber.

Furthermore, Baldwin, Jr. et al. does not expressly disclose wherein the second frequency of the second power is less than one tenth of the first frequency of the first power and wherein an impedance of the coil or antenna with respect to the first power with the first frequency is at least two times more than the impedance of the capacitor coupled to the coil or the antenna, and wherein an impedance of the coil or antenna with respect to the first power with the first frequency is at least one fifth of the impedance of the capacitor coupled to the coil or the antenna. Tobe et al. discloses using a radio frequency power source 52 to be coupled to an antenna with frequencies ranging from 10 kHz to 100 MHz (see col. 9-lines 16-20). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Maeda et al. modified by Baldwin, Jr. et al. so as to

Art Unit: 1763

provide radio frequency power supplies having usable frequencies in the range of Tobe et al. because such power supplies are shown to be suitable for supplying power to antennas in an inductively coupled apparatus. Furthermore, with respect to the particular claimed relative frequencies and impedances, Furthermore, with respect to the particular claimed relative frequencies and impedances, the limitations are directed to the method instead of the apparatus. However, since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of Maeda et al. modified by Baldwin, Jr. et al. and Tobe et al. is capable of producing the claimed relative frequencies and impedances.

Concerning claims 2-3 and 9-10, note that the impurity in the apparatus of Maeda et al. modified by Baldwin, Jr. et al. and Tobe et al. is deposited on a surface of the portion of the container and is provided inside the portion of the container.

Furthermore, with respect to claim 7, note that a device can be formed by the apparatus of Maeda et al. modified by Baldwin, Jr. et al. and Tobe et al..

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-3, 5-10, and 12-13 have been considered but are moot in view of the new ground(s) of rejection.

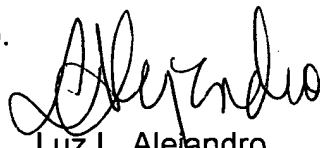


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Luz L. Alejandro  
Primary Examiner  
Art Unit 1763

September 6, 2005